

APRIL 25-27, 2006 · HOUSTON, TEXAS

Deepwater Riser ENGINEERING COURSE

The course will provide a complete and up-to-date technical overview of deepwater riser engineering, from concept selection for field development, to preliminary design, detailed analysis and design, material selection and welding, fabrication, installation, inspection, and maintenance.

ORGANIZED BY



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SUPPORTED BY



WHO SHOULD ATTEND:

Engineers from oil companies, engineering service companies, construction companies, pipe and service suppliers and regulatory authorities, who are newly qualified, have recently moved into riser engineering or hold broad responsibilities that include risers.

The course is especially suitable to those who wish to broaden their knowledge of deepwater riser engineering or deepen their technical understanding of specific riser types.

In particular:

- Newly qualified riser engineers (designers and analysts)
- Experienced riser project engineers who want to expand their knowledge
- Sub-project managers (of subsea contractors including risers)
- Subsea supervisors / managers
- M. Sc. students in offshore engineering

COURSE SCOPE

- Overview of marine risers focusing on deepwater application from material selection to offshore installation.
- Detailed lectures on design and analysis methods with particular attention to Top Tensioned Risers (TTR) and Steel Centenary Risers (SCR)
- Review and comparison of riser design codes and industrial standards
- Field applications discussed throughout lectures

CONTINUING EDUCATION UNITS (CEUs)

On satisfactorily completing the course, participants will be eligible to receive 2 CEUs.

COURSE DOCUMENTATION

Participants receive a sturdy ring binder containing all the lecture slides with notes and illustrations supporting the lectures and providing an invaluable reference source after the course.

COURSE LECTURERS

Erin Balch is a Senior Specialist at MCS Houston with broad engineering experience of floating production riser and mooring systems. She has considerable experience in the specification, design, verification, installation, and integrity management of floating production risers. She has worked extensively in flexible risers, umbilicals and drilling risers and has a keen understanding of the design, manufacturing and testing challenges associated with these risers. Before working for MCS, she gained valuable experience in the design of floating production mooring systems.

Patrick Boster is President of RTI Energy Systems, a supplier of production riser systems and engineering solutions such as subsea tiebacks utilizing tapered stress joints of both steel and titanium. Prior to joining RTIES, Mr. Boster worked for ABB as manager of the Materials & Welding Group and then started his own company, Weld-Tech Engineering, supplying materials technology, manufacturing, welding and related services. Weld-Tech was acquired by RTI International Metals in 1998.

Dr. Roger Burke, P.E., is lead of the top tensioned riser analysis group of the Riser Technology and Well Systems Department of Technip Offshore, Inc. Engineering. He has 14 years of experience in design and analysis of deepwater riser systems. He joined Technip Offshore in February 2000.

Conor Galvin is an Engineering Team Leader with MCS with considerable experience in the design and analysis of steel risers, hybrid risers and flexible risers for production and offloading systems. Mr. Galvin has a B.E. in Mechanical Engineering from University College, Dublin, Ireland and is a Member of the Institution of Engineers of Ireland.

Kieran Kavanagh is President of MCS Houston. He holds a Masters degree in Offshore Engineering from University College Cork, Ireland, and a degree in Economics from the London School of Economics. He has 18 years, experience in offshore engineering, specializing in the design and analysis of

floating production steel and flexible risers and umbilicals. He has also been responsible for mooring system design, vessel motions analysis and steel structural design.

Dr. Ruxin Song has more than 15 years working experience focusing on risers and pipelines. He has been the lead engineer for some large well-known riser and pipeline projects in North Sea, Gulf of Mexico and Offshore Brazil, including the EMDC Kizomba Tower riser, Statoil Gullfaks pipeline and riser bundles, BP Thunder Horse risers, Petrobras Roncador risers. Dr. Song has published 30 technical papers in international journals and conferences and been actively involved in design code development. He is a member of several international associations including ISOPE, MTS and IAOE. Currently Dr. Song is a Principal Associate in the Riser Technology Department of Technip Offshore, Inc., Houston.

Dr. Paul N. Stanton is Vice President of the Riser Technology and Well Systems Department of Technip Offshore, Inc. He has 36 years of experience in deepwater floating drilling research and engineering, subsea production research, TLP and Spar well systems research and development, and riser engineering management. Paul is active in development of API and ISO standards for dynamic riser systems.

Glenn Wald is a Senior Staff Mechanical Engineer, Shell Oil. He has 25 years experience in the industry. His primary area of expertise is design, procurement and installation of Spar and TLP riser systems. This includes concept evaluation, system design, component design, interface management, and riser component manufacturing.

COURSE PROGRAM

OVERVIEW (P. STANTON, TECHNIP OFFSHORE)

- Riser Types
- Riser Concept Selection for Field Development
- Factors in Riser Selection
- Cost Comparison
- Technical Challenges and Potential Solutions
- Riser Risk Analysis and Integrity
- Inspection, Maintenance and Repair
- Deepwater Riser JIPs and R&D Activities
- Design Code General
- Design Format Expressions
- Limit State Categorization
- LRFD vs. WSD
- Comparison of API RP 2RD and DNV OS F201
- New API RP 2RD Developments
- Regulatory Requirements

FUNDAMENTALS OF RISER ENGINEERING (K. KAVANAGH, MCS)

- Finite Element Method ABC
- Solution Methods (Eigenvalues, Frequency Domain, Time Domain)
- Wave Theory and Hydrodynamics ABC
- Catenary Theory
- SN Curves vs. Fracture Mechanics
- Rain Flow Counting Method

TOP TENSIONED RISERS (G. WALD, SHELL OIL)

- Dry Tree vs. Wet Tree Concepts
- Global Configuration
- Subsea Layout
- Well Bay Layout
- Pros and Cons of Each Configuration
- Component Level Description
- TTR Examples

HYBRID RISER SYSTEMS (G. WALD, SHELL OIL)

- Global Configuration
- Tower Risers
- Hybrid Risers
- Truss Risers
- Offset Risers
- Tension Leg Risers
- Pros and Cons of Each Configuration
- Component Level Description
- Hybrid Riser Examples

STEEL CATENARY RISERS (C. GALVIN, MCS)

- Global Configuration
- Simple Catenary Configuration
- Lazy Wave Configuration
- Pros and Cons of Each Configuration
- Component Level Description
- Riser Top Hang-Off System
- Riser Closing Spool
- Riser Joints
- VIV Suppression Devices
- Buoyancy Modules
- Cathodic Protection System
- Riser Coating (Anti-Corrosion and Thermal Insulation)
- Thicker Pipe Section
- Riser End Termination
- Catenary Riser Examples

FLEXIBLE RISERS (E. BALCH, MCS)

- Global Configuration
- Simple Free Hanging Catenary Configuration
- Lazy Wave Configuration
- Pliant Wave Configuration
- Chinese Lantern Configuration
- Steep S Configuration
- Pros and Cons of Each Configuration
- Component Level Description
- Cross Section
- End Fittings
- Bend Stiffener
- Top Vessel Interface Termination
- Subsea End Termination
- Clamp and Anchorage Pile
- Riser Support Structures and Arch Support
- Flexible Riser Examples

RISER DESIGN METHODS OVERVIEW (R. SONG, TECHNIP OFFSHORE)

- Design Philosophy, Principles and Objectives
- Design Spirals
- System Key Design Issues
- Design Methods General
- Design Acceptance Criteria
- Safety Factor and Design Format
- System Interface Design
- Analysis Considerations
- Component Design Considerations
- Design Beyond Codes

FUNCTIONAL REQUIREMENTS AND DESIGN DRIVERS (K. KAVANAGH, MCS)

- General Design Requirements
- Design Procedure and Acceptance Criteria
- Functional Requirements for TTRs
- Functional Requirements for SCRs
- Functional Requirements for Hybrid Risers
- Functional Requirements for Flexible Risers
- Environmental Loading
- Design Drivers (Material, Fabrication, Welding, Coatings, Testing, Inspection, etc.)
- Metocean Data and Criteria

RISER SYSTEM ANALYTICAL TOOLS (R. SONG, TECHNIP OFFSHORE)

- Riser Software Selection Requirements
- General FEA Tools
- Riser Global Analysis Tools
- Riser VIV Tools
- Riser Installation Analysis Tools
- Coupled System Analysis Tools

DESIGN BASIS DEVELOPMENT (R. SONG, TECHNIP OFFSHORE)

- General Riser Design Basis
- Typical Structure of Riser DBD
- Boundary Limits and Scope of Work
- Regulatory Requirements
- Codes, Standards and Project Specs
- Design Data
- Design and Analysis Methodology
- Design Requirements and Acceptance Criteria
- Other Design Issues
- Example of an SCR DBD

TTR ANALYSIS AND DESIGN METHODS (R. BURKE, TECHNIP OFFSHORE)

- TTR Design Phases
- Definition of Basic Configuration
- DBD Development and Preparation
- Design Steps

- Pipe Sizing
- Tensioning System Sizing
- Riser Stroke Analysis Riser Component Sizing
- VIV Induced Fatigue Analysis
- TTR Interference Analysis
- Strength Analysis
- Computer Modeling
- General Fatigue Analysis
- Centralizer Spacing Analysis
- Riser Running Analysis
- Buoyancy Can Compliant Guide Reaction Analysis
- Compliant Guide Design (SPAR)
- Installation Analysis
- Difference between Spar TTR and TLP TTR
- TTR Design Example

TTR COMPONENT DESIGN (G. WALD, SHELL OIL)

- TTR Design Options
- Wellheads & Tie-Back Connectors
- Riser Joints Design
- Spar Keel Joints
- TLP TTR Tension Joints
- Tensioning System Option and Design
- Riser Joint Buoyancy Option
- Surface Tree Option
- Topside Production Jumpers
- Stress Joints
- Buoyancy Cans and Guides

HYBRID RISER ANALYSIS AND DESIGN (G. WALD, SHELL OIL)

- Hybrid Riser Analysis
- Modeling Approach
- Riser Sizing
- Strength Analysis
- VIV Analysis
- General Fatigue Analysis
- Design Example

HYBRID RISER COMPONENT DESIGN

- Riser Pipe Design
- Buoyancy Modules

This program is in simplified outline form. To view the complete syllabus, please visit WWW.CLARION.ORG. Course fee includes lunch and refreshment breaks each day.

REGISTRATION FORM or REGISTER ONLINE AT WWW.CLARION.ORG

COURSE FEE

- Deepwater Riser Engineering Course, April 25-27, 2006: \$2195

DISCOUNTS (check as appropriate)

- Simultaneous multiple registrations from the same company:

\$150 discount per person

Please submit a separate registration form for each registrant. We will credit the discount to each person.

- Early Registration (registrations received prior to March 27, 2006):

\$100 discount

- Marine Technology Society Members members: 10% discount (may not be combined with other discounts)

Your Individual Member Number: _____

PAYMENT OPTIONS

- I will mail a check payable to

Clarion Technical Conferences
3401 Louisiana Street, Suite 255
Houston, TX 77002 USA

- Send me an invoice. If you require a Purchase Order, please call +1 713-521-5929 or fax to +1 713-521-9255.

- Bank transfer details - Call us: 713-521-5929 (US)

FAX us: 713-521-9255 (US)

Email us: bjlowe@clarion.org

- Call us (+1 713-521-5929)

- Credit Card: Visa MasterCard American Express Diner's Club

Name on the Card

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REGISTRATION FORM

Name

Title

Company

Email

Area Code & Phone Number

Area Code & Fax Number

Mailing Address

City, State Postal/Zip Code

Country



PAYMENT

Payment by check or credit card is due in full prior to the start of the event.

VENUE & ACCOMMODATION

Fees do NOT include accommodation.

The course will be held at:

The Houstonian Hotel
111 North Post Oak Lane
Houston, Texas 77024

Tel. 713.680.2626

Fax 713.688.6305

e-mail: hotelgm@houstonian.com

The hotel is in the Galleria area of central Houston and is about 40 minutes from both Hobby and Bush Intercontinental airports. Economy shuttle service to the hotel is available through Airport Express at Tel. (713) 523-8888. Be sure to mention that you are attending the Deepwater Riser Engineering Course to obtain our discounted rate (limited availability).

CANCELLATIONS/ SUBSTITUTIONS

1. Cancellations made in writing and received **10 business days prior to the event** will be refunded less a \$100 handling fee.
2. Cancellations received after this date will not be refunded, and the full invoice fee will be payable regardless of whether you attend the event or not.
3. Substitutions may be made at any time.
4. Confirmation will be made in writing as soon as possible upon receipt of payment. This confirmation will be sent to the address given on the registration form, unless otherwise required.

EVENT CANCELLATION

The organizers reserve the right to cancel any course due to insufficient enrollment. In this event, fees will be refunded in full. However, the organizers assume no liability for travel or any expenses other than fees paid.



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